

Name: \_\_\_\_\_

10 Pts.

## Chemistry Practice: The Mole; Concepts, Calculations and Comparisons

### 1. Concepts:

- \_\_\_\_\_ Which SI base unit is used to define the amount of substance?
- \_\_\_\_\_ The number  $6.02 \times 10^{23}$  is named in honor of the Italian chemist \_\_\_\_\_.
- \_\_\_\_\_ What is the mass of  $6.02 \times 10^{23}$  molecules of water?
- \_\_\_\_\_ STP refers to a temperature of \_\_\_\_\_ °C and \_\_\_\_\_ atm pressure.
- \_\_\_\_\_ What is the mass of 1 mole of Mg atoms.
- \_\_\_\_\_ What volume will 1.0 mol of mercaptin gas occupy at STP?
- \_\_\_\_\_ How many molecules of  $\text{SO}_2$  are in 1.0 mol of  $\text{SO}_2$  gas?
- \_\_\_\_\_ One mole of an element was found to have a mass of 65.4 grams. What is the element?
- \_\_\_\_\_ How many molecules of hydrogen are contained in 22.4 L of  $\text{H}_2$  gas?
- \_\_\_\_\_ How many atoms of Br are in 1 molecule of  $\text{Br}_2$ ?



### 2. Conversions:

- What is the mass of 2.50 moles of KCl?
- How many grams of oxygen gas are contained in  $30.0 \text{ dm}^3$  of oxygen gas at STP?
- How many molecules of tetraphosphorous decoxide are in  $2.00 \times 10^3 \text{ g}$  of tetraphosphorous decoxide?
- What volume at STP will 0.50 mol of ammonia gas have?
- 0.0032 grams of nicotine (F.M.= 162 g/mol) are contained in 1 cigarette. How many molecules is this?
- What is the mass of  $3.88 \times 10^{21}$  units (molecules) of magnesium nitrate?
- 3.00g of dry ice (solid carbon dioxide) is converted to a gas at STP. How many moles are present of this gas?
- How many molecules are in a 1.86 mol sample of riboflavin?
- What is the mass of 3.62 moles of sodium carbonate?
- What volume will 325 grams of sulfur dioxide occupy at STP? What is the density of this gas at STP?

### 3. Comparisons:

- \_\_\_\_\_ 1 mole of Ag atoms contains ( more / less / the same number of ) atoms than/as 1 mole of Au.
- \_\_\_\_\_ 1 mole of  $\text{H}_2\text{O}$  contains (more / less / the same) mass as one mole of  $\text{UF}_6$ .
- \_\_\_\_\_ 1 mole of  $\text{C}_6\text{H}_{12}\text{O}_6$  contains (the same number as / more / less ) atoms of C as 1 mol of  $\text{CO}_2$ ?
- \_\_\_\_\_ 1 mol of  $\text{H}_2$  gas occupies (more / less / the same ) volume as 1 mole of  $\text{SO}_2$ .
- \_\_\_\_\_ Rank from LEAST to GREATEST amount of Ca atoms:  
A.) 0.2 mol Ca      B.)  $1 \times 10^{20}$  Ca atoms      C.) 10 g Ca